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Plato et al.

(54) VACUUM

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This patent is subject to a terminal dis-

claimer.

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(56) References Cited

U.S. PATENT DOCUMENTS

2,221,746 A	* 11/1940	Kirby A47L 5/30
2,322,223 A	* 6/1943	15/324 Coss A47L 5/32
6.170.118 B1	* 1/2001	15/324 McIntyre A47L 5/365
		15/323 Tarutani A47L 5/14
0,550,2 11 D1	1/2002	15/326

(Continued)

FOREIGN PATENT DOCUMENTS

DE	202011002455	ak	3/2011
EP	2644072		10/2013

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(57) ABSTRACT

The present invention is directed to a vacuum including a dust extraction system. The system includes a filter assembly, an airflow generation assembly, and valve assembly. The airflow generation assembly is configured to draw contaminated air toward the filter assembly and exhaust filtered air as a discharge stream. The filter assembly is configured to remove contaminants from the contaminated airflow by capturing particulate material suspended within the airflow. The valve assembly is configured to selectively direct filtered airflow into the filter assembly such that the filtered air stream cleans the filter.

17 Claims, 43 Drawing Sheets

